SECRET

25X1A

OUT #1331

357 DELIVERY WITH DIRECT DRIVE.
347 HAS TEST ALTERNATOR.
351
358] HYD NOT OPERABLE. WHY NEEDE
CAMERA VIBRATION PROBLEM?

ROUTINE
ROUTINE

REF. [redacted] 4109 SECRET

25X1A [redacted]

INFO: [redacted]

SUB: J-75 ALTERNATOR

The following summarizes our position on the alternator situation on articles using J-75 engines:

1. Constant Speed Drive

Design studies were made, approx. eight months ago, to determine the feasibility of installing a constant speed drive on articles employing the J-75 engine. This type of drive was considered impractical for the following reasons:

a. There is no available equipment capable of being mounted directly on the engine.

b. The C.S.D. and alternator must be mounted to the airframe and driven by shaft, through universal joints.

c. There is insufficient space within the present airframe to install the C.S.D. and alternator without complete re-arrangement of the engine compartment.

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~~16~~

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ROUTINE
ROUTINE

REF. [redacted] 4109 SECRET

25X1A [redacted]

INFO: [redacted]

SUB: J-75 ALTERNATOR

d. The only available drive pad is the pad presently used to drive the D.C. generator, ~~which caused~~ thus causes item (c)

e. the D.C. generator to be driven by the nose pad (N_1) through a suitable gear box.

f. It is impractical to drive the alternator from the nose pad, through the necessary drive shaft and universal joints as the C.S.D. and alternator has to be mounted in the crotch area, requiring a complete re-design and re-arrangement of the equipment already installed there.

g. It is considered impractical to mount the C.S.D. and alternator in a pod outside the airplane as an increase in drag, and a decrease in range would result. Also, access to the engine would be greatly reduced.

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REF. [redacted] 4109 SECRET

25X1A [redacted]

INFO:

SUB: J-75 ALTERNATOR

2. Hydraulic Driven Alternator

A Hydraulic System was designed and tested employing a pump, motor, and attendant equipment, to drive the alternator. A separate hydraulic system was installed, because of the critical nature of the hydraulic system employed to operate the fuel booster pump.

This system weighs approx. 75 pounds, including the alternator. Due to this weight increase, plus the added complexity to the airframe both in installation and maintenance, it was felt that if there was a simpler, lighter, and cheaper method of doing this job, it should be used, and if there was not, then the hydraulic drive would be used.

3. Direct Drive Alternator

A five KVA, 115/200 volt, three phase, eight pole alternator was mounted to the nose pad of the engine. This system is in process of flight testing and has proven satisfactory, with the exception of a

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REF. [redacted] 4109 SECRET

25X1A [redacted]

frequency reduction at reduced engine speeds for long range missions. The frequency range is 420 cps at T.O. to 350 cps at 70,000 feet after seven and one half hours, when using cruise profiles as outlined in the Flight Handbook. Alternate cruise profile is contained in reference msg.

The suppliers of systems III, VI, IV, VII, were contacted as to the effects of operating the systems at 350 cps.

System III & VI

Overheating of transformers is the critical item at 350 cps. R.W. informs us that transformers capable of operating within the range of 420-350 cps are available and capable of being installed in systems III & VI. These transformers can be shipped to detachments in six weeks. One transformer required in system III and four transformers required in system VI. These new transformers are slightly heavier than the original. The weight increase is approx. four pounds.

System VII

[redacted] state that there is no problem operating this

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25X1A [redacted]

system at 350 cps. The system has operated at lower frequencies than 350 cps, but they felt that 350 cps was the lowest frequency that they would guarantee.

System IV 25X1A

The cooling blowers in this system are critical at reduced frequencies. No info is available as to the effect of low frequencies, however, R W and [redacted] intend to test this system at 350 cps to determine the effect at the lower frequency, and to take any corrective action necessary to insure proper operation. It is our 25X1A understanding that [redacted] has requested these tests not be conducted until a later date. The system as outlined in paragraph 3 above will add approx. 40 pounds, including alternator, to the basic airplane, or 35 pounds less than the existing hydraulic driven alternator system. Due to the lightness and simplicity of the system outlined above in para 3, we request approval of this system as a permanent installation. Request that [redacted] permit blower tests on system IV to proceed.

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DB
CR/DB

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RI

DIRECTOR

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[redacted]

DPD (1,2,3,4,5,6,7,8,9,10)

S/C (11)

GG 25X1A

TOR: 0006Z 21 OCT 59

ROUTINE

IN 09738

DOWNGRADED TO: TS S (C) 2811
NEXT REVIEW DATE:
AUTH: HR 70-2
DATE: 2/14/84 REVIEWER: 037189

TO [redacted] INFO [redacted] 25X1A [redacted] 0961

REF: [redacted] 4109 (IN 09511) 25X1A

25X1A

SUBJ: J-75 ALTERNATOR

THE FOLLOWING SUMMARIZES OUR POSITION ON THE ALTERNATOR SITUATION ON ARTICLES USING J-75 ENGINES:

1. CONSTANT SPEED DRIVE REPEAT CONSTANT SPEED DRIVE DESIGN STUDIES WERE MADE, APPROX EIGHT MONTHS AGO, TO DETERMINE THE FEASIBILITY OF INSTALLING ALFA CONSTANT SPEED DRIVE ON ARTICLES EMPLOYING THE J-75 ENGINE. THIS TYPE OF DRIVE WAS CONSIDERED IMPRACTICAL FOR THE FOLLOWING REASONS:

A. THERE IS NO AVAILABLE EQUIPMENT CAPABLE OF BEING MOUNTED DIRECTLY ON THE ENGINE.

B. THE C.S.D. AND ALTERNATOR MUST BE MOUNTED TO THE AIRFRAME AND DRIVEN BY SHAFT, THROUGH UNIVERSAL JOINTS.

C. THERE IS INSUFFICIENT SPACE WITHIN THE PRESENT AIRFRAME TO INSTALL THE C.S.D. AND ALTERNATOR WITHOUT COMPLETE RE-ARRANGEMENT OF THE ENGINE COMPARTMENT.

D. THE ONLY AVAILABLE DRIVE PAD IS THE PAD PRESENTLY USED TO DRIVE THE D.C. GENERATOR, WHICH CAUSED

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[redacted] 0961 (IN 09738) PAGE -2-

E. THE D.C. GENERATOR TO BE DRIVEN BY THE NOSE PAD (N1) THROUGH A SUITABLE GEAR BOX.

F. IT IS IMPRACTICAL TO DRIVE THE ALTERNATOR FROM THE NOSE PAD THROUGH THE NECESSARY DRIVE SHAFT AND UNIVERSAL JOINTS AS THE C.S.D. AND ALTERNATOR HAS TO BE MOUNTED IN THE CROTCH AREA, REQUIRING ACOMPLETE RE-DESIGN AND RE-ARRANGEMENT OF THE EQUIPMENT ALREADY INSTALLED THERE.

G. IT IS CONSIDERED IMPRACTICAL TO MOUNT THE C.S.D. AND ALTERNATOR IN A POD OUTSIDE THE AIRPLANE AS AN INCREASE IN DRAG, AND A DECREASE IN RANGE WOULD RESULT. ALSO, ACCESS TO THE ENGINE WOULD BE GREATLY REDUCED.

2. HYDRAULIC DRIVEN ALTERNATOR

A HYDRAULIC SYSTEM WAS DESIGNED AND TESTED EMPLOYING A PUMP, MOTOR, AND ATTENDANT EQUIPMENT, TO DRIVE THE ALTERNATOR. A SEPARATE HYDRAULIC SYSTEM WAS INSTALLED, BECAUSE OF THE CRITICAL NATURE OF THE HYDRAULIC SYSTEM EMPLOYED TO OPERATE THE FUEL BOOSTER PUMP.

THIS SYSTEM WEIGHS APPROX 75 POUNDS, INCLUDING THE ALTERNATOR. DUE TO THIS WEIGHT INCREASE, PLUS THE ADDED COMPLEXITY TO THE AIRFRAME BOTH IN INSTALLATION AND MAINTENANCE, IT WAS FELT THAT IF THERE WAS A SIMPLER, LIGHTER, AND CHEAPER METHOD OF DOING THIS JOB, IT SHOULD BE USED, AND IF THERE WAS NOT, THEN THE HYDRAULIC DRIVE WOULD BE USED.

3. DIRECT DRIVE ALTERNATOR

A 5 KVA, 115/200 VOLT, 3 PHASE, 8 POLE ALTERNATOR WAS MOUNTED TO THE NOSE PAD OF THE ENGINE. THIS SYSTEM IS IN PROCESS OF FLIGHT TESTING AND HAS PROVEN SATISFACTORY WITH THE EXCEPTION